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REMARKS/ARGUMENTS

The Applicant thanks Examiner for the detailed Office Action dated November 28, 2006. In response to the issues raised, the Applicant offers the following submissions and amendments.

Amendments

Independent claims 1, 19 and 38 have been cancelled in favor of newly presented claims 55, 56 and 57. New claims 55, 56 and 57 highlight the combination of features that provide the low energy ejection of ink drops. In particular the suspension of the heater element to thermally isolate it from the wafer substrate, the short heater to nozzle spacing to reduce the mass of ink displaced by the vapor bubble, and a long ink supply path relative to the heater to nozzle distance to reduce energy lost to generating a back-flow of ink. The relatively long ink supply path (and the fluidic drag it provides) is discussed at page 12, lines 12-17, and again at page 16, lines 17-21. The thermal efficiencies of the suspended heater element are discussed in detail in the subsection "Suspended Beam Heater" beginning on page 19.

The depended claims have been amended (or cancelled if appropriate) such that they align with the new independent claims.

Accordingly the amendments do not add new matter.

Claims – 35USC§103

Claims 1, 19 and 38, *inter alia,* stands rejected as obvious in light of US 5,706,041 to Kubby in view of US 6,067,919 to Shirota et al in further view of US 4,870,433 to Campbell et al.

These claims have been cancelled in favor of new independent claims 55, 56 and 57. As discussed above, the combination of features defined in the new claims provide the low energy ejection of ink drops from each nozzle. Low energy ejection is crucial to the self cooling operation of the printhead. With the heaters better insulated from the wafer, the nozzles can be fabricated more closely together. Feeding the ink from the back of the wafer allows the printhead to have the nozzle packing densities permitted by the thermal insulation of the heater from the wafer. Skilled addressees appreciate that ink supply conduits running

along the ejection side of the wafer use up valuable wafer 'real estate' that could otherwise support additional nozzles. Suspending the heater elements in a plane parallel to the nozzle ensures the side of the bubble facing the nozzle is broader and flatter so that the pressure pulse is likewise flatter for better drop directionality.

Also as discussed above, having the heater close to the nozzle improve efficiency, and does having a relatively long ink inlet. However, to fabricate a suspended that is heater parallel to the nozzle, is not readily apparent or straight forward. None of the cited documents disclose a suspended heater in this orientation or provide any suggestion as to how this might be achieved. Accordingly, the printhead defined in the new independent claims is not an obvious derivation of the citations.

Accordingly, the present invention is not anticipated by the teachings of Kubby in view of Shirota and Campbell.

The additional references cited against the dependent claims also fail to disclose heaters suspended parallel to, and less than 50 microns from, the nozzle, while maintaining an ink inlet that is at least quadruple the heater to nozzle spacing. It follows that the additional citations, in combination with Kubby, Shirota and Campbell, fail to render any of the dependent claims obvious.

It is respectfully submitted that all of the Examiner's objections have been successfully traversed. Accordingly, it is submitted that the application is now in condition for allowance. Reconsideration and allowance of the application is courteously solicited.

Very respectfully,

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